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The Energy Division of the Department of Natural Resources and Conservation (DNRC) has established a lending library of 53 videotapes. The videotapes are available for loan free, one or two at a time, to owners and operators of commercial and institutional buildings in Montana. DNRC requires borrowers of its videotapes to observe the copyright laws applicable to the material. All tapes are in 1/2-inch VHS format.

AIR CONDITIONING

Air Conditioning and Refrigeration Systems: Schematics and Symbols, TPC, 1982, 15 min., with handbook. Talks about reading diagrams for compressors, condensers, evaporators, and discharge and auxiliary lines. #020.

Air Conditioning Components, VG, 1991, 23 min., with handbook. *New Title*. Offers information on evaporators, condensers, and compressors. #051.

Basic Air Conditioning, Parts 1 and 2, TPC, 1979, 29 min., with handbook. "Measurement of Heat" and "Pressure and Heat Transfer" discuss BTUs, conduction, convection, radiation, and Boyle's and Charles' laws. #016.

Basic Air Conditioning, Parts 3 and 4, TPC, 1979, 32 min., with handbook. "The Air Conditioning Cycle" and "Operation of an Air Conditioner" discuss vaporizers, compressors, condensers, coils, fins, gauges, and valves. #017.

Basic Air Conditioning Circuit, VG, 1991, 15 min., with handbook. *New Title*. Offers a basic understanding of forces at work within the refrigerant circuit. #050.

Refrigeration Theory, ECI, 1991, 30 min. *New Title*. Covers refrigerants, expansion valves, and piston, rotary, screw, and centrifugal compressors. #046.

BOILERS

Blow Down or Blow Up, FMEC, 10 min. *New Title*. Talks about overheating and destruction of boilers resulting from low water, and describes operation and testing of low-water controls. #052.

Boiler Design and Construction, ISA, 1988, 26 min. Talks about fire-tube and water-tube boilers. #024.

Boiler Feedwater and Steam, ISA, 1988, 27 min. Looks at feedwater controls, boiler tubes, water chemistry, blowdown techniques, and safety devices. #025.

Boiler Maintenance, Operation, and Safety, ETH, 30 min., with handbook. Covers operating characteristics and safety controls for atmospheric and power burner boilers. #003.

Boiler Operations, Fireside, VCA, 1974, 15 min. Looks at feed systems and combustion in gas- and oil-fired systems, drafts, ignition, and metering ratios. #028.

Boiler Operations, Waterside, VCA, 1974, 20 min. Describes boiler cut in/off, blowdown, header pressure, steam controls, and valves. #027.

Boiler Theory and Controls, ECI, 1990, 50 min. *New Title*. Addresses basics of boilers, and explains boiler-flame safeguard controls and burner motors. #053.

Boiler Waterwall Inspection, NUS, 13 min. Covers problems such as overheating, tube support failure, corrosion, ash accumulation, and refractory failure. #043.

VIDEOTAPE DISTRIBUTORS

AMW - Armstrong Machine Workshop
CIC - Culligan International Co.
ECI - Energy Controls, Inc.
EPRI - Electric Power Research Institute
ETH - E. T. Harlow Co.
FMEC - Factory Mutual Engineering Corp.
IES - Illuminating Engineering Society
ISA - Instrument Society of America
ITI - Industrial Training, Inc.
Minn - Minnesota Dept. of Public Service
Navy - U.S. Navy
NUS - NUS Training Corporation
OSU - Oregon State University
TPC - TPC Training Systems
Utah - Utah Energy Office
VCA - Video Communication Associates
VG - Video General

External Boiler Inspection, NUS, 10 min. Shows how to find casing support failure, inspect valves, and check for leaks, corrosion, and other problems. #042.

Introduction to Boilers: An Overview, ISA, 1988, 34 min. Summarizes the operation of coal, oil, and gas-fired boilers and steam systems. #023.

Oil Burner Repair and Maintenance, Navy, 37 min. Discusses how to clean and adjust an oil-fired boiler. #035.

Safe and Efficient Boiler Operations, OSU, 1987, 36 min., with handbook. Shows how to save money on fuel, repairs, and other operating costs for small boilers. #001.

The Chemistry of Water Conditioning, CIC, 1989, 60 min., with handbook. Talks about the chemical and molecular structure of water and contaminants and their effects. #036.

Water Treatment Process Fundamentals, CIC, 1989, 65 min., with handbook. Addresses oxidation, filtration, adsorption, regeneration, de-ionization, osmosis, and pH. #037.

STEAM SYSTEMS

Guidelines for Steam/Air Coil System Design, AMW, 1988, 13 min. Explains causes of frozen steam coils and how to prevent problems. #013.

Guidelines for Steam System Efficiency, AMW, 15 min. Looks at piping needed to achieve optimum efficiency. #009.

Guidelines for Steam Trap Repair, AMW, 1988, 20 min. Outlines types of steam traps, gives techniques for repairing each, and shows how to spot faulty ones. #012.

Guidelines for Steam Trap Troubleshooting, AMW, 19 min. Describes how to establish a preventive maintenance program, emphasizing testing of various traps. #007.

Let's Talk Steamtraps/Update, AMW, 1984, 32 min. Discusses differential condensate controllers and inverted bucket, thermostatic, and disc steam traps. #010.

Solving the Water Hammer Puzzle, AMW, 24 min. Addresses causes, effects, and prevention of water hammer on a steam system. #008.

The Anatomy of the I.B., AMW, 15 min. Looks at performance and components of inverted bucket steam traps. #011.

HVAC—ELECTRICAL

Alternating Current and Variable Speed Drive Controllers, TPC, 1987, 20 min. Gives information about electric motors, AC current, inverters, converters, induction, synchronous speed, slip, and hertz. #019.

Basic Electrical Troubleshooting, ITI, 1981, 17 min. Uses test instruments to locate circuit defects such as opens, shorts, and excessive resistance and current. #026.

Basic Electricity for Servicing, ECI, 1990, 38 min. *New Title*. Summarizes basic electrical problems found in heating and air conditioning equipment. #045.

Electricity for HVAC: Working Wires, VG, 1991, 18 min., with handbook. *New Title*. Looks at AC and DC voltages, magnets, induction, transformers, and relay switches. #047.

Electricity for HVAC: Inside Circuits, VG, 1991, 19 min., with handbook. *New Title*. Explains Ohm's Law, the traits of series and parallel circuits, and load resistance. #048.

Electricity for HVAC: Electricity at Work, VG, 1991, 24 min., with handbook. *New Title*. Introduces electrical wiring, the reading of different diagrams, and troubleshooting of circuits. #049.

OTHER HVAC

Developing Troubleshooting Skills, TPC, 1982, 115 min., seven parts. Looks at strategies using specific tools, records, and diagrams for approaching mechanical and electrical problems and conducting planned and breakdown maintenance. #015.

Economizer Testing and Tune-up, ETH, 30 min. Shows how to adjust make-up and return air dampers in a HVAC system. #004.

NOTICE

These videotapes are offered as a public service, but some of the tapes are product-oriented. Any reference to specific products or HVAC systems does not constitute an endorsement by DNRC. Viewers should thoroughly investigate any claims made and draw their own conclusions about suitability or performance of a product or system before purchase or use.

Fan System Theory and Honeywell Controllers, ECI, 65 min. Describes mixed air systems, heat pumps, furnaces, duct systems, and component calibration and repair. #032.

Fan System Theory and Johnson Controls Controllers, ECI, 63 min. Describes mixed-air systems, heat pumps, furnaces, duct systems, and component calibration and repair. #033.

Fan System Theory and Robertshaw Controllers, ECI, 57 min. Describes mixed-air systems, heat pumps, furnaces, duct systems, and component calibration and repair. #034.

Honeywell Thermostats, ECI, 1989, 35 min. Covers pneumatic thermostats and cleaning and calibration. #029.

Hot Water Reset For Hydronic Heating System, ETH, 17 min., with handbook. Describes hot-water system, reset control, three-way mixing valve, and checking set points. #005.

Johnson Controls Thermostats, ECI, 1989, 36 min. Covers pneumatic thermostats and cleaning and calibration. #030.

Let's Talk PRVs, AMW, 1987, 30 min. Discusses saturation curves, automatic and mechanical controllers, diaphragms, bellows, and pistons. #022.

Multizone Hot Deck Controls, ETH, 17 min., with handbook. Describes a multizone air handling system and the resetting of deck temperature based on outside temperature. #006.

Multizone Maintenance and Operations—Lennox, ETH, 18 min. Looks at tune-up and adjustment of a rooftop HVAC system. #021.

O&Ms: A Guide to Energy Efficiency, Utah, 1984, 15 min. Provides an overview of the operation and maintenance steps that can be applied to commercial or retail buildings. #040.

Pumps and Motors, TPC, 1987, 20 min. Offers information about how hydraulic pumps and hydraulic motors work. Shows how to decipher model codes and what they mean. #018.

Robertshaw Thermostats, ECI, 1989, 32 min. Covers pneumatic thermostats and cleaning and calibration. #031.

Unit Ventilator Reconditioning, ETH, 22 min. Looks at operation and maintenance of ventilators and face and by-pass dampers. Covers cleaning, re-gasketing, and adjusting linkages. #002.

LIGHTING

Fundamentals of Lighting: Course for Design Engineers and Architects, IES, 1987, 16 hours. (Consists of eight tapes of a 2-day seminar.) Discusses nature of light, light sources and energy issues, and interior and exterior lighting. #038.

Lamps and Luminaires, IES, 1982, 20 min. Talks about energy-saving lamps, high-intensity discharge, and warm and cool renditions. #014.

Office Lighting Design, EPRI, 1986, 9 min. Shows the variety of lamps available and how they can be used to save electricity and improve productivity. #041.

MISCELLANEOUS

Bringing Solar Electricity to Earth, EPRI, 1990, 29 min. Discusses research on solar cells or photovoltaics, and shows how they're being used today. #044.

Energy Net, Minn, 1989, 18 min. This take-off of "Dragnet" follows an energy analysis of a business and introduces the dollar benefits of energy conservation. #039.

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VIDEO ORDER FORM

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